sections fall far below what might have been anticipated. At the Fisheries Exhibition in Berlin three years ago, Japan was excellently represented; and when we recollect that fish forms one of the principal—probably next to rice and millet, *the* principal—staples of Japanese food, that the fishing-grounds extend from the most northern Kuriles almost within the Arctic circle, through various zones down to the most southern islands of the Loochoo archipelago, where they approach the sub-tropical regions, and that the primitive methods of catching and preserving fish of more than one race are now daily practised in various parts of this chain of islands, known as the Japanese Empire, it will be seen what scope the Japanese authorities had to make their section of much practical and scientific interest. At Berlin their section did possess such interest, and the collection formed for exhibition there has, we believe, been made the nucleus for a domestic and permanent Fisheries Exhibition in Tokio. Failing the time or funds necessary to make a representative collection for London this year, it was open to the Japanese Government to take a single portion of their vast fishing-grounds—such as Yezo, or the Inland Sea, or the Loochoo Archipelago—and represent that only. This has been done by China with marked success. As it is, Japan is represented in the small space allotted to her by specimens of the fish tinned at the Government canning establishments at Sapporo in Yezo, and by a stall full of pictures on silk, lacquer, &c., of fish and fishing. These latter are all marked, "For sale at the close of the Exhibition." Doubtless the Japanese authorities had good reasons of their own for thus limiting their participation in the present Exhibition; still it is permissible to express regret that they did not add, as they undoubtedly could have done, more to its value and interest.

In the Malay States and the Straits Settlements fish is not such a staple of food as in Japan, and they are on the whole fairly represented. The curious Malay method of catching fish by constructing long and labyrinthine bamboo and cane fences, wide at the beginning and narrowing towards the end, where the fisherman's hut is placed aloft, is represented by two or three models. These long fences, sometimes stretching far out to sea, are familiar objects to every traveller in the Straits. They are protected by stringent local ordinances, and woe betide the unskilful shipmaster who runs his vessel through them.

The Chinese section, viewed from a popular standpoint, is certainly a success. No pains appear to have been spared to make it representative of the Celestial Empire in its decoration. The Chinese ambassador himself has contributed two scrolls in large characters containing verses of poetry. To the staff of the Imperial Customs under Sir Robert Hart—foremost in all that is for the welfare and good name of China—belongs the credit of this section. It would of course be impossible to represent in a single foreign contribution the fisheries of China, extending over more than 2000 miles of coast line, as well as many thousands of miles of rivers and canals, and accordingly it was decided to represent thoroughly one portion of the coast. At Berlin the Ningpo fisheries were so represented, and for this year, Swatow, a treaty port on a large estuary a little to the north of Canton, was selected. The nets, boats, lines, traps, and other implements used in fishing here, the dresses of the fishermen at various seasons, models of their huts, and a scientific classification of the fish caught in this district, form the bulk of the Chinese exhibits. In addition to Swatow, an attempt has been made also to represent Ichang, a port on the Yang-tsze, situated about 1000 miles from the sea, as well as the fisheries of South Formosa and the neighbouring islands. The collections were evidently made and catalogued in China and arranged here by experienced hands. The special catalogue published by the order of Sir Robert Hart forms a complete descriptive guide to the whole, and is most interesting and instructive. Speaking generally, it may be said that the observer is most struck in this section with the extraordinary ingenuity displayed in utilising the most ordinary and unpromising objects for the purpose of fishing. Thus in Swatow they employ a boat drawing a few inches of water, with the rail nearly level with the surface. A narrow plank fixed along one side is painted white, and the light of the moon falling on it causes the fish to mistake it for water. They jump over the plank into the boat, where they get entangled in moss or grass. At Ichang, a wild animal such as the otter is trained, not to catch fish, but to frighten them into the net; while at Ningpo, cormorants are regularly and systematically trained to fish. These and many other devices shown at the Exhibition mark the Chinese as the most ingenious and accomplished fishermen in the world. A large collection of corals, of crustaceans, mollusks, and other fish will attract the scientific observer, who will be much assisted in his examination by the special catalogue before mentioned.

NOTE ON THE INFLUENCE OF HIGH TEMPERATURE ON THE ELECTRICAL RESISTANCE OF THE HUMAN BODY

THE experiments which I have now for some years been carrying out as to the various forms of medical electricity have begun to furnish trustworthy results. Some of these, with the help of De Kilner, were incorporated in a paper read before the Society of Telegraph Engineers on March 9, 1882. We there stated that at present "we are hardly in a position to say how far the resistance of the body varies in health; but in disease it can be fairly stated that it sometimes diminishes and sometimes augments." Of this fact we gave illustrations.

It had often occurred to me that the temperature of the human body very probably influences its resistance; and some experiments had been made with a view of testing the amount of such influence. But in pathological researches it is often difficult to find a case not open to exception, and it is frequently necessary to wait a considerable time before, in the impossibility of experiment, accident presents one possessing the necessary conditions. Such a case I have now met with, and it is worth while to place it on record, if only to enable other observers to prosecute this line of investigation.

The patient is a young and intelligent gunsmith aged twenty-two. He had rheumatic fever severely twelve years ago, which, as is usual in young subjects, has left permanent heart disease behind it. This did not, however, prevent his following his trade until the beginning of April in the present year. He then began to suffer from morning rigors, occurring at first at the interval of from seven to ten days, but, since Easter, daily. He came into my ward in St. Thomas's Hospital on April 28. It is not necessary to detail the medical history of the case in a scientific periodical; it will be sufficient to state that about 8.30 a.m. he was in the habit of suffering from severe attacks not unlike those of ague, in the course of which the temperature rapidly rose to 105° F. In the afternoon it sank to the normal human temperature of 98° or 99° F. The cause of this remarkable symptom is still somewhat obscure; it has completely resisted the action of quinine and other antiperiodics, as well as salicylic acid, aconite, and other approved lowerers of temperature. It is probably due to ulcerative endocarditis slowly advancing. The most remarkable part of the case is that it causes the patient no suffering or inconvenience whatever. His mind is clear, and, except the feeling of chilliness during the period of heat, he makes no complaint. He is able to take interest in the determinations which I proceed to give.

It occurred to me that this unusual range of daily tem-

perature (7 F.) afforded the opportunity I had long been seeking. But it was some time before I could arrange suitable apparatus for its examination. A hospital ward is an awkward place for Wheatstone's bridge and delicate galvanometers. Moreover I had before found that from the peculiar conditions of the human body, the testing current, to produce accurate results, requires to be frequently reversed, for fear of opposition currents of polarisation. I am glad to see a confirmation of this observation in a verbal communication of Prof. Rosenthal to the Physiological Society of Berlin on April 13.

It was partly to overcome this difficulty that I devised, at Mr. Preece's suggestion, a dynamometer for alternating currents, of which the general arrangement was described in NATURE some time ago. It was also brought before the Physical Society at their June meeting in Oxford. Although severely criticised by some members of that learned body, it works extremely well, and may be, I hope, an addition to medico-electrical appliances. For the purpose of the present experiment I found that an ordinarily sensitive galvanometer, considerably damped by air-resistance, was sufficient, since by the zero methods of balancing, it is only necessary just to see the deflection before commutating; when balance is obtained, commutation has no effect on the needle of the bridge.

It would require more space than could probably be here afforded to give all details of the experiments, which, moreover, by the courtesy of Capt. Douglas Galton, I hope to bring before the British Association of this autumn. But a brief summary of results is as follows:—

On June 5 I reached the ward at 9.40 a.m. The rigor had begun at 8.30 and was beginning to decline; I had time, however, for the following determinations:—

9 40	R. 4140 ohms.
9·55	,, 3470 ,,
10.10	,, 2900 ,,

These measurements were taken with a very small E.M.F. of about 9 volts. On June 9 I succeeded in reaching the ward during the beginning of the rigor, and took the following measurements, this time with corresponding temperatures:—

10.30 a.m.	Temp. 102°·4 ...	R. 4550
10.40 ,, ...	,, 104°·2 ...	,, 4630
10.50 ,, ...	,, 104°·2 ...	,, 4930

At this point the rigor, temperature, and resistance began to descend. I visited the patient again at

2·15 p.m.	Temp. 103° ...	R. 2300

The apparatus in these observations was left untouched, so as to prevent any accidental change. The measurement was made with a double E.M.F. to those preceding, namely, 18 volts. I determined on each occasion the resistance of the leads and terminals, which I found to be on each occasion 2 ohms.

I cannot help thinking that the difference, which is as nearly as possible twice the smaller amount, is too great to be accounted for by any instrumental error, and that the human body, in spite of its large amount of liquid constituents, follows a similar thermal law of resistance to that influencing solid conductors, though in a very much higher ratio.

Only one other point requires comment, namely, the mode of making contact between the body and the testing apparatus. Prof. Rosenthal in the communication quoted above draws attention to the high insulating powers of the epidermis. In the above experiment I passed the current through the two legs, from one foot to the other, in alternate directions. The feet were previously soaked in salt and water; two large pans containing about a quart of brine each were then placed under the feet, and in each was immersed a plate of copper five inches square connected with the bridge by stout cables. I have found in other experiments that after half an hour the resistance ceases to decrease, and in this experiment it actually increased to the amount of 480 ohms. The whole foot was immersed, its sole resting directly on the copper plate. I have two other methods of making contact in use. The first consists of rubbing the skin with the oleate of mercury; which to the diffusion power of oleic acid adds the conductivity of its base, and then immersing the part in metallic mercury. The other consists of inserting small silver claw-forceps, known to surgeons as "serrefines," through the epidermis into the tissue below. This is rather painful, but not more so than I find medical students eager in the pursuit of knowledge can and will easily undergo.

W. H. STONE

THE AMBER FLORA[1]

THIS is the first volume of a work on the flora of the amber-bearing formations of East Prussia, and is devoted exclusively to Coniferæ. The introduction contains a sketch of the geological history of the order, and among much that is of interest we find an estimate that the existing Coniferæ occupy an area of about 3,000,000 square miles (500,000 German). The described fossil species are now almost as numerous as the living (400 to 450), though a revision might reduce their number by one-half. The colossal dimensions of some of the living Coniferæ are familiar to most, but it is not generally known how nearly these are rivalled by fossil species. Examples are given, as of a stem of *Cupressinoxylon ponderosum*, broken at both ends and 200 feet long, and another 12 to 14 feet across; a stem of Araucarites, 25 feet in circumference, and a silicified stem from California, 33 feet round the butt.

A considerable portion of the work is occupied with a minute and splendidly illustrated inquiry into and description of the microscopic structure of the tissue of existing and fossil Coniferæ, especially with regard to their resin-secreting organs. Goeppert claims to have originated this study forty years ago, and is certainly the chief authority in it. The result of his work shows that the Abietineæ, or fir tribe, have almost alone contributed the amber, and that at least six species produced it, the chief being close allies of the Common Spruce and the American *Pinus strobus*. These possess three separate sets of resin-producing organs chiefly situated in the cambium layers, which are in the form of cells and ducts running in both horizontal and vertical directions, and appearing at a very early stage of growth. Some Pines are liable to frost-cracks, and into these the resin collects and thence exudes, keeping the wound from healing and furnishing a perpetual supply. Very few specimens of amberwood preserve the bark layers with the resiniferous organs, but sufficient is seen to prove that these in no way differed from those of the Abietineæ at the present day, especially of the Spruce.

The most important section of the work probably is the research into the microscopic structure of the wood, which is, however, of an extremely technical nature. Five separate species of *Pinus* are recognised by their wood, and a very rare and doubtful wood-structure is referred to the Taxineæ.

More interesting perhaps to the general reader are the descriptions of fragments of foliage and fructification inclosed in the amber. Insignificant as the figured specimens appear, they are yet in so marvellous a state of preservation that their texture and microscopic structure, and even the glaucous colouring of the under sides of some of the leaves are visible. Twenty species are determined, with a tendency, it is pleasing to find, rather to curtail than to multiply the number previously described. They have been studied with extraordinary care, and the results are consequently unusually satisfactory.

[1] "Die Flora des Bernsteins." R. Goeppert and A. Menge, Naturforshenden Gesellschaft in Danzig. 4to, 1883.